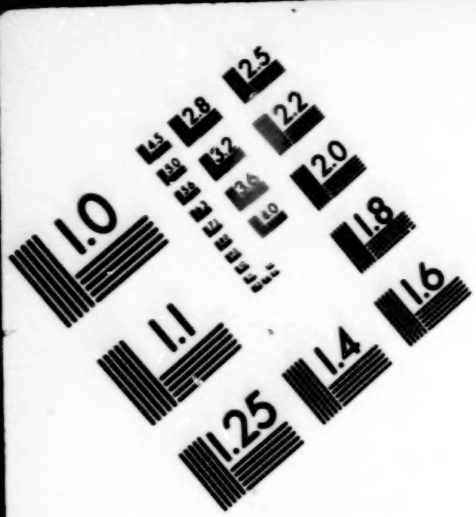
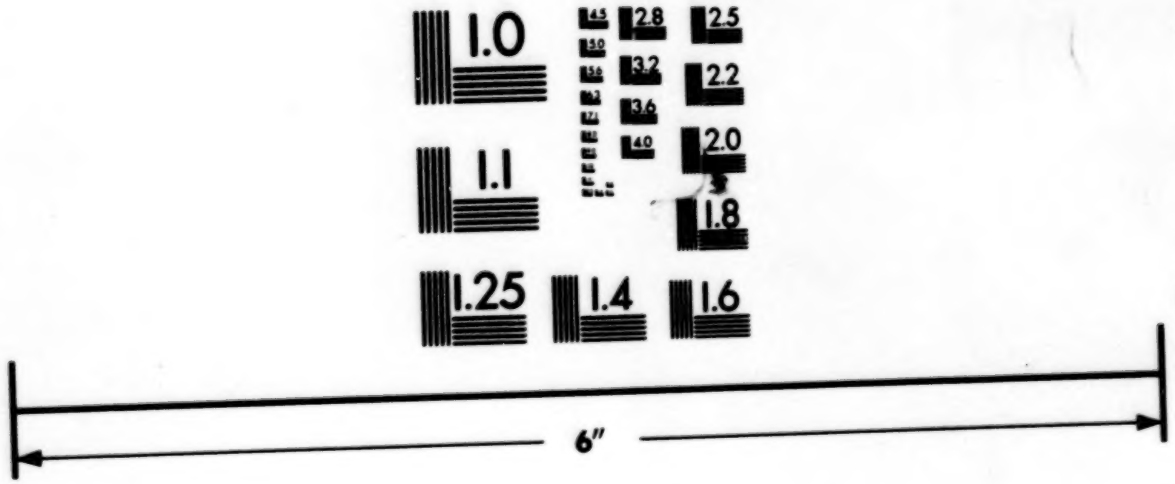


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic Sciences Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

JPRS 82568

30 December 1982

USSR Report

ENERGY

No. 131

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 82568

30 December 1982

USSR REPORT

ENERGY

No. 131

CONTENTS

FUELS

OIL AND GAS

ELECTRIC POWER

NON-NUCLEAR POWER

GENERAL

OIL AND GAS

CONFERENCE ADDRESSES PROBLEMS OF DEEP DRILLING AT SEA

Baku VYSHKA in Russian 25 Oct 82 p 4

[Article: "A Practical Payoff From a Scientific Idea"]

[Text] New oil and gas deposits from 4,000 to 7,000 meters below the ground are being developed in Azerbaijan under complex geological conditions. Their offshore development beneath deep sea basins requires creation of new technical resources and production processes, improvements in the traditional methods of drilling and reinforcing wells, and a high level of mechanization and automation of drilling processes. One of the most important prerequisites of successfully solving the problems facing the oilmen today is an integrated, scientifically grounded approach coupled with concentration of the efforts of scientists and producers on raising the effectiveness and the practical payoff of research.

Working jointly with drillers employed by enterprises of the "Azneft'" Production Association and the "Kaspmorneftegazprom" All-Union Production Association, the republic's scientific research organizations and institutions of higher education have solved the problems associated with developing new deposits on land and at sea, and they have achieved good results in mass drilling of both vertical and slant wells. Much has been done to mechanize laborious drilling processes in difficult geological conditions.

But at the same time the nonproductive losses of time and materials are still great in deep drilling. The volume of the results of completed scientific research projects introduced into drilling practice is insignificant, and a number of scientific developments are not being introduced into production on an industrial scale.

The results and directions of scientific research on the deep wells were discussed at a republic scientific-technical conference. It was opened with introductory remarks from Azerbaijan SSR Academy of Sciences Academician M. T. Abasov. Azerbaijan SSR Academy of Sciences Corresponding Member M. K. Seid-Rza, director of the Azerbaijan SSR Scientific Research and Planning Institute of Petroleum Industry, gave a report on the role of scientific-technical progress in solving the problems facing the republic's drillers in the 11th Five-Year Plan.

Prominent specialists and executives of the production operations of the republic's drilling enterprises, scientists, oilmen and machine builders took part in the conference proceedings. The directions of further research and introduction of scientific developments into production were planned.

11004
CSO: 1822/71

OIL AND GAS

THERMOCORUNDUM FLOW REGULATOR PRODUCTION UNDER WAY AFTER TROUBLED HISTORY

Baku BAKINSKIY RABOCHIY in Russian 23 Oct 82 p 2

[Article by G. Bezkorovaynyy: "Azerbaijan Thermocorundum"]

[Text] In his speeches at Baku, Comrade Leonid Il'ich Brezhnev laid special emphasis on the fact that the sector's reequipment has important significance to stabilizing petroleum extraction and to increasing it. The solution to this problem, Leonid Il'ich Brezhnev emphasized, depends to a great deal on local initiative and resourcefulness.

A good confirmation of this profound thought can be found in creation of a production operation (the country's first) in our republic manufacturing thermocorundum flow regulators for producing oil wells. The article published here today tells this story.

Most of the petroleum deposits presently being developed in the republic consist of loose rock that breaks down in the course of their exploitation. As a consequence a large quantity of sand is brought to the surface together with the fuel. When the pressure is significant, the sand eats away metal of even the highest strength in a short time. Corrosion of the well head flow regulators of flowing and compressor-assisted wells has especially dangerous consequences: The operating rhythm is disturbed, which often leads to severe consequences, going as far as permanent shut-down of the well. Each year the outlays on replacing worn parts, units and equipment total enormous sums.

The rate of wear of flow regulators and all of the equipment increases even more if the reservoir fluid contains hydrogen sulfide in addition to sand. And this is true of most of the wells. In a word, the material from which flow regulators are made must be wear resistant in a current of abrasive-containing liquid. Such a material was sought unsuccessfully by Azerbaijani oilmen for many long years.

Thirty years ago the VNIIASh (All-Union Scientific Research Institute of Abrasives and Grinding of the USSR Ministry of Machine Tool and Tool Building Industry, Leningrad) developed a fabulous material which could even serve as a

substitute for diamonds in jobs requiring the working of parts with heightened precision and surface cleanliness. For this outstanding invention, a number of the institute's colleagues were awarded the USSR State Prize. In view of the complexity of the production process and the novelty of the invention at the time, the institute took upon itself the obligation of organizing the material's production, for the time it took to decide which plant of the Ministry of Machine Tool and Tool Building Industry or the Ministry of Instrument Making was to be given the contract for series production of articles made from thermocorundum (this was the name that was given to the new material). And so the little institute laboratory began producing it.

Azerbaijani oilmen "cast their vote" in favor of this material. A thermocorundum flow regulator manufactured by the institute at their request exhibited 10 times greater wear resistance than bushings made from the best brands of steel. Every thermcorundum flow regulator provided a savings of more than 50 rubles, and the demand for them totals in the tens of thousands. Thermocorundum parts could also be used in the filters of wells with a high temperature at their bottom hole. Interested in introducing its development, the VNIIASh consented to supply the republic's oilmen with small consignments of the flow regulators, naturally until such time that industry could organize their mass production.

These dreams were not fated to come true. In an article titled "Fatal Thermocorundum" EKONOMICHESKAYA GAZETA (No 44, 1981) told us that the VNIIASh had been trying to pass on the process for producing articles out of thermocorundum to abrasive plants of the Ministry of Machine Tool and Tool Building Industry and enterprises of the Ministry of Instrument Making unsuccessfully for 30 years (!). More than a quarter of a century of correspondence and attention-getting efforts led to naught. Meanwhile the institute has its own objectives and plans--scientific ones. In 1977 it reported to "Azneft'" that it was going to halt production of flow regulators in the year following.

The oilmen requested organization of their production by enterprises of the "Soyuzabraziv" All-Union Production Association: "The republic's petroleum and gas extraction administrations are experiencing considerable difficulties in supporting normal operation of more than 2,000 wells due to the absence of thermocorundum flow regulators." But their request was denied. Nor did correspondence with the USSR Ministry of Petroleum Industry and USSR Ministry of Machine Tool and Tool Building Industry produce any results.

The oilmen had nothing left to do but try to organize production of thermocorundum articles on their own.

The board of directors of "Azneft'" assigned the job of determining the possibility of their production to the Specialized Office of Operation and Repair of Electric Submersible Oilfield Units. Naturally the procedures associated with repairing pumps and extracting petroleum differed significantly from the procedures of making thermocorundum, but selection of this enterprise was not accidental. The collective of the specialized office took part in the solution of urgent problems of the "Azneft'" association more than once, and it solved them successfully. Moreover the specialized office was undergoing reconstruction, and flow regulator production could be worked into the reconstruction plan.

In the course of the discussion of the choice, yet another circumstance was revealed, one which turned out to be decisive: The problem of producing thermocorundum was not something new to the executives and the party bureau of the specialized office.

"Having created a high-capacity repair base using modern production procedures, we completely eliminated the need for deliveries of spare parts and electric submersible units from outside," explained enterprise director V. Rafiyev. "This was with the exception of one tiny part--a ring made from a mineral-ceramic alloy. It is inserted into the watertight seals of the electric motors of the units. The material of this ring is identical to thermocorundum, and naturally the production process is similar. But it was economically unfeasible for us to produce just these little rings. We could commit only a small proportion of our equipment time to the material. This is why when the discussion turned to production of flow regulators in 'Azneft'' we readily consented to get into the thermocorundum business."

"But it is one thing to have a general idea about a material and the production processes, and it is a totally different thing to develop concrete proposals for solving the problems--proposals which had to serve as the basis for the action of institutes, planning offices and builders; moreover the material resources that have to be invested are sizeable," added the chief engineer of the specialized office, M. Ginzburg, who was given the job of working with thermocorundum full time.

After the Baku specialists returned from their business trip to Leningrad, not only did they have a full idea about the production process, but also they came to realize why industry had refused so stubbornly to initiate production of thermocorundum. Furst of all the process of obtaining the initial powder was extremely intricate and meticulous, since the particle size could not exceed 2 microns; second, articles made from the powder had to be sintered at a temperature on the order of 1,800°. The institute's furnace, in which the charge and the fuel come in contact, could not satisfy the needs of the oilmen: After a batch of flow regulators was fired, it had to be set aside to cool for several days. The reheating process was long as well. And if the venture was to be undertaken, they would have to have the latest equipment--an electric vacuum furnace. But industry was just beginning production of such furnaces.

Nevertheless it was decided at a conference of the board of directors and party bureau of the specialized office, in which the business trip to Leningrad was reported, that the difficulties were surmountable. The board of directors of the institute, meanwhile, encouraged by the fact that someone finally came along who decided to seriously take on industrial production of thermocorundum, pledged to supply oilmen with the flow regulators for another 3 years and to help in the training of production personnel. The issue was examined in the Central Committee of the Azerbaijan SSR Communist Party with the participation of executives from "Azneft'," planning institutes and the specialized office. The following goal was posed: The republic's petroleum industry had to receive the necessary quantity of thermocorundum flow regulators in not less than 3 years hence.

The schedule for organizing production of the articles did not fit into the commonly accepted order of planning and construction: Preparing the section

for the new shop could itself take up several months. The board of directors of the specialized office decided to set up the shop in place of one of the facilities that was undergoing reconstruction, and to move the latter to a new area, formally reserving the territory for its construction in the appropriate manner.

They had barely managed to raise a roof over the shop before the equipment began coming in. There was no place to store it. It was decided to begin installing the furnaces without waiting for the builders to finish the shop. But the subcontractors would not stand for this: Installation could not proceed until the shop was completely built. And so it was decided at a general party meeting that the furnaces were going to be installed by the enterprise's own people. Brigades were made up out of the most qualified fitters, welders, electricians and fitters specializing in spare parts, tools and automation equipment. They worked oblivious to the time.

Many new things had to be learned in the course of the work: welding stainless and heat-resistant steels with a vacuum-tight seam, installing brittle tungsten heating elements and heat shields, and so on. This intricate work was found to be within the means of brigades headed by communists A. Aliyev, Kh. Talybov, B. Bespalov and Sh. Ramazanov and by non-party members M. Kuliyev and N. Semyannikov. Komosomol members V. Rakhmanov, T. Galashvili and I. Shevchenko distinguished themselves. A brigade of fitters specializing in spare parts, tools and automation equipment led by A. Zarutskiy installed the highly complex automatic system of the furnaces, which was saturated with electronic components. Specialists of the "Azerelektroterm" provided what assistance they could. A great deal of work was done by chief mechanic V. Gaydamakin, by chief power engineer V. Trushchelev, by V. Gukasov who was appointed chief of the shop in its construction stage, and by the material-technical supply service headed by M. Kudratov.

In the very first tests on the equipment it was revealed that the designers had not accounted for the climatic conditions of Azerbaijan: Water in the cooling tower overheated. Nor was a possibility foreseen for an extremely small rate of temperature increase, as was required by the thermocorundum production process. Changes had to be made in the design.

In parallel with assembly of the equipment, the process of acquiring the fine powder was assimilated. The procedure developed by VNIIASh 30 years ago required the use of acids, and it was accompanied by considerable dust formation. Specialists of the specialized office decided to try to use a brand of alumina developed in 1980 by the All-Union Aluminum-Manganese Institute (VAMI, Leningrad). Its use not only simplified the production process but also made manufacture of the flow regulator ecologically clean. The specialized office signed a contract with the institute to develop and study the process for sintering the new powder. The institute was unable to complete the details of the production process by the time the furnaces were ready. These details were cleared up locally. Then came hundreds of experiments. And finally the first batch--30 flow regulators--were shipped out to "Ordzhonikidzeneft'" and "Azizbekovneft'" for testing. The conclusion was that they were not inferior to the best produced by the VNIIASh.

I am now sitting in V. Rafiev's office. There is a set of flow regulators of different diameters on his desk. And a pile of orders for them from various petroleum and gas extraction administrations. Hundreds of the flow regulators are now operating at the oilfields. That which specialized enterprises of the country were reluctant to do in the course of 3 decades, oilmen of Azerbaijan did in 3 years.

This article is titled "Azerbaijani Thermocorundum." True, the oilmen did not invent the new material, but they did not simply copy the tested technology of the VNIIASh. They made a bold decision to use a new brand of alumina, and to perform the sintering in electric vacuum furnaces. And they achieved a remarkable result in a short time. This gives us the right to attach the Azerbaijani label to this variant of acquiring and introducing thermocorundum.

This success was not just good luck. Without a solid foundation, without creative inquiry, without confidence in one's strengths and without an awareness of exactly what is needed, nothing can be done. And, pondering the creative and labor achievements of the collective of the specialized office in the year of the 60th anniversary of the USSR's formation, one is convinced yet another time that the republic's petroleum industry possesses a powerful scientific-technical potential and highly qualified personnel bearing the rich traditions of the country's petroleum academy. And if all petroleum extracting and scientific collectives orient themselves on moving forward through common effort, on making fuller use of the available possibilities in stabilizing and increasing oil extraction and on raising the effectiveness of their work, all of the tasks posed by the party and by Comrade L. I. Brezhnev to the sector will be completed.

11004
CSO: 1822/71

MANGYSHLAK GAS REFINERY NOW UTILIZING BYPRODUCT GAS

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 13 Oct 82 p 2

[Article by correspondent G. Dil'dyayev: "Mangyshlak Gas"]

[Text] Ten years ago I had the opportunity to sail by tanker out of Baku to the seaport of Aktau by the city of Shevchenko. The tanker was going for another load of Mangyshlak oil. As we approached the coast during the night, we saw on the distant horizon a trembling red glow: Gas was burning from innumerable torches at refineries located far in on the peninsula. They had no choice but to burn it: At that time there was no system for collecting and utilizing the byproduct petroleum gas. A year later some of the torches, which purposelessly burned fuel and a rich chemical raw material, were quenched: The first generation of the Kazakh gas refinery built near the city of Novyy Uzen began operating. The commissioning of this enterprise represented the birth of a new sector of the republic's industry--gas refining.

Liquified gas and gasoline produced by the Kazakh gas refinery is being sent to many addresses. And consumers of household gas are being supplied propane-butane throughout all of Central Asia. Moreover the plant workers are helping the crude extractors. They supply compressed gas to the system for gas-lift petroleum extraction. Production of high-octane raw material from which to make polymers has also been started here, at a large plastics plant built in Shevchenko.

In a word, the Kazakh refinery occupies a special place in the system of interrelated production operations making up the Mangyshlak territorial production complex. Since it began operation, a million tons of liquid petroleum products have been produced here.

In the first 8 months of this year the refinery workers surpassed the production plan by a thousand rubles, they completed the gasoline production plan by 108 percent and that of liquified gas and ethane production by 104 percent, and they delivered 662 million cubic meters of blue fuel to the Central Asia-Center gas pipeline.

The successes of the collective are all the more substantial because they were achieved in the course of the enterprise's reequipment. For the first time in Soviet practice high-power K-890 centrifugal compressors were installed at

the refinery and are now successfully operating there. The gas lift shop is also continuing its operation as it undergoes reconstruction.

The Kazakh gas refinery has won many prize-winning places in competitions among kindred enterprises in the oblast.

11004
CSO: 1822/70

OIL AND GAS

PRESENCE OF GAS, OIL AT ASTRAKHAN CONFIRMED

Moscow SOVETSKAYA ROSSIYA in Russian 12 Oct 82 p 1

[Article by RSFSR Minister of Geology L. I. Rovnin: "The Caspian Storehouse"]

> [Text] The State Commission for Mineral Reserves of the USSR Council of Ministers confirmed the reserves of sulfur, natural gas and condensate in the subsoil of the Astrakhan deposit. The editor's office asked RSFSR Minister of Geology L. I. Rovnin to comment on this event.

The search for petroleum and gas in Astrakhan Oblast began long ago, more than 2 decades back. But the search never produced any positive results. It was only in the south of the region that a few small formations were discovered, ones offering no industrial interest.

Nonetheless the geologists of this region by the Caspian had substantial grounds for expanding their investigations. In 1970 an expert geological council of the RSFSR Ministry of Geology once again attentively examined the data gathered by research in Astrakhan Oblast and decided to initiate drilling of so-called parametric and exploratory wells along the entire margin of the Caspian depression. It was at that time that the notion of the existence of Astrakhan deposits was suggested.

To the explorers of the subsoil, this region turned out to be a "tough nut to crack." The exploratory wells were unable to reveal a gas-bearing horizon for a long period of time owing to the complexities of the geological structure. Productive beds are covered here by 2 or 3 kilometers of salts that tended to crush the steel piping. High reservoir pressure made the work of the drillers more complicated. Special drilling and casing pipe and corrosion-resistant well head equipment had to be employed. Under these highly difficult conditions every drilling rig essentially became an independent experimental production operation. The explorers of the subsoil continually sought new technological concepts and technical resources that could withstand the caustic medium and open the way to the gas formation. Great persistence and a creative approach to the effort were displayed by engineers G. Ivanov and G. Magomedov, by drilling foremen A. Sinel'nikov and P. Isaulov, and by others whose labor was finally graced with success.

In 1976 a long-awaited event that had been prophesied a long time ago occurred. The drilling rig run by foreman V. Shatin from the Astrakhan petroleum and gas prospecting expedition produced a huge gas gusher. It was now evident that the new gas condensate deposit was industrially feasible in terms of its gas reserves and the concentration of useful byproducts. Astrakhan gas will be utilized not only as a fuel and energy resource but also as a chemical raw material. It contains much sulfur, a highly valuable mineral that serves as the basis for production of agricultural fertilizers.

The Astrakhan deposit fundamentally altered our ideas about the fuel and energy potential of the European part of the country. In accordance with decisions of the 26th CPSU Congress an industrial complex will be created in this region, and it will begin extracting and refining gas and condensate, and producing sulfur.

It would be important to note that exploration of the Astrakhan anticline has not yet been finished. In the next few years geologists will establish the exact contours of the gas formation and determine its total volume. We are certain that the deposit's reserves are significantly greater than believed today. Geophysical research is showing that other gas and petroleum storehouses exist at even greater depths.

The deposit has become a major construction site. Drilling rigs that will tunnel the first producing wells are being erected, and oilfield structures are under construction.

11004
CSO: 1822/70

OIL AND GAS

APSHERON OIL PLENTIFUL BUT OUT OF REACH

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Oct 82 p 2

[Article by V. Kremer and D. Melikov: "Apsheron's Subsoil Has Not Grown Scanty"]

[Text] We get about half of all of our petroleum and gas today from West Siberia. We are rightfully proud of the unprecendented rate and scale of development of this rich, harsh land, and we are delighted by the courage and technical boldness of the pioneers of the northern subsoil. But in this light, the obvious fact that the second, equal half of nationwide extraction of highly valuable fuel and chemical raw materials is provided for by the traditional oil-bearing regions and that their significance to the economy is just as substantial somehow pales and drops into the background.

One such region is Azerbaijan, the oldest representative of world petroleum industry. More than a billion tons of "black gold" have been yielded by the republic's subsoil to the people in more than 100 years of intensive exploitation. Second and third "Bakus" have appeared on the geological map, and the sons of Azerbaijan have unlocked the underground storehouse of Tyumen Oblast. And the glory of old Apsheron has faded and grown dim. Moreover it has faded not only in the comparison. Recently the extraction level of Baku oil, unique in quality, has been rolling downhill.

Leonid Il'ich Brezhnev turned his attention to this alarming trend in his speech at the celebrations in Baku. He also expressed confidence that Azerbaijani oilmen, who boast glorious traditions of innovation, will be able to stem the decline, and stabilize and even increase petroleum extraction.

But meanwhile the oil and gas extractors of the republic are dissatisfied with the work. The "Azneft'" and "Kaspmorneftegazprom" associations are unable to meet the plans. The prestige of the oilman's profession has fallen, and personnel turnover at the oilfields has reached a critical limit. In a word, the grounds for concern and criticism are quite sufficient.

It may be, however, that no one is really at fault, that the despair stems from natural causes: After all, the reserves of the underground storehouses are not inexhaustible. Is there any powder left in the magazines? Or has the time come to consider the decline and fall of Azerbaijan's oil career? These are hard questions to answer. They affect the fates of hundreds of thousands of people

and the fate of a sector of the greatest importance to the country and the republic. But these questions are posed by life itself, and answer them we must.

"There are no grounds for considering the decline and fall of the republic's oil career," believes Doctor of Geological-Mineralogical Sciences F. Dadashev, whom we met at the Institute of Geology of the Azerbaijan SSR Academy of Sciences. "Our reserves of crude hydrocarbons are enough to last a long time to come. More than 150 formations offering favorable conditions for accumulation of petroleum and gas have been revealed just on the Caspian shelf alone, not counting the areas that are already being worked. There are also many promising deposits on land."

Practical geologists, who are ordinarily more cautious in their estimates, reveal full solidarity with the opinion of this authoritative scientist. They name deposits that doubtlessly contain industrially feasible petroleum and gas fields: Kyursangya, Karabagly, Pirsagat, Neftechala, imeni 28 aprelya, Bullamore, imeni 26 Bakinskikh komissarov. And they also name ones that recently produced hopeful results: Sashdag, Amirarkh, Shakhovo-more, Andreyev's Bank and the land between the Kura and Iora rivers. We were surprised to learn that in terms of available reserves, "fading" Azerbaijan is one of the richest regions of the country!

Even ancient Apsheron has not said its last words. It did not seem possible that any new discoveries could be expected from this well-ridden land. But then prospectors of the subsoil dug their way down to ancient Miocene deposits at one of the old oilfields, where simple oilwells had worked back at the beginning of the century. And their first well raised their hopes with a fully respectable yield for these parts--5-6 tons of petroleum per day.

V. Gadzhiyev, the general director of "Azneft'," supplemented this information with the following facts. Out of every three wells drilled on the peninsula in different years, only one reaches down to the lower stories in which two-thirds of the extractable (that is, absolutely feasible) reserves of Apsheron oil are concentrated. The annual collection of fuel from these beds represents an extremely small proportion of the available resources.

The possibilities of increasing extraction of petroleum, and especially of gas, from the Caspian Sea are even more impressive. Many promising deposits are located in areas where the sea is not too deep, areas permitting industrial development. Other areas can be developed by means of partially submerged "Shel'f" floating drilling rigs and deep-water offshore platforms.

But on the background of these possibilities, the disconcerting bottom line only stands out more vividly: In a relatively short time, petroleum extraction in the republic dropped significantly. What is the matter? Let us look at the picture from closer up.

The Petroleum and Gas Administration imeni N. Narimanov is second in size following the famous Neftynyye Kamni. Its trestles have extended far out into the open sea from Cape Sangachala. Individual platforms have made their way even farther, to the volcanic islands of Duvannyy and Bulla. A visit from

reporters did not elicit any great enthusiasm from the administration chief, Gasan Gumbatov.

"Maybe we aren't worth writing about at all?" he asked hopefully. "We can't meet the plan, the wells keep flooding and the yield is dropping."

One could understand his position: The offshore oilmen had nothing to boast about today. Just recently they had extracted almost 5 million tons of petroleum per year from the Caspian floor. Now the figure is less than 3 million. And in the last year of the five-year plan, we were told, extraction will decrease to 2 million. This is the joyless future.

We no longer see those huge gushers which had earlier caused us to shout about the great wealth of the Baku archipelago. Today, the wells bring up 20-30 tons of subterranean water with every ton of oil. And the high proportion of water is a good sign of something wrong with the deposit.

"Excuse me, but we were told that there are still untouched areas in this region of the Caspian at accessible depths."

"From the practical aspect, to us they are like stars in the sky," replied Gumbatov. "They shine, and they entice us, but just try to reach them! The whole problem lies in the fact that we do not have any clear prospects: Where do we go from here, in which direction do we develop? There, one exploratory drilling rig lured us with good test results, and here another.... But we do not as yet have any new areas prepared for industrial development."

This problem agitates not only the oilmen of Sangachala. Today prospecting operations are being conducted on land and at sea simultaneously in 40 areas in the republic. It would seem logical: The broader the exploration front, the greater would be the hopes of success.

In haste, however, a rich storehouse could easily be missed, and never be discovered. It is difficult to judge if the effort is worth it in each concrete case on the basis of isolated wells scattered among many formations. Many specialist with whom we spoke on this subject validly believe that it would be better to concentrate attention on really promising regions. This would make it possible to hasten their preparation for exploitation. The list of such regions, incidentally, was approved not that long ago at an expanded session of the soil science department of the republic's Academy of Sciences.

However, the force of inertia is still great. Where we need a massed offensive, we often limit ourselves to a few small assaults. This is significantly retarding the revelation and development of new deposits along the lower reaches of the Kura and on the Caspian shelf, where the first industrial flows of fuel were obtained a dozen or so years ago.

Some wells at one of them, "Muradkhanlinskiy," yield 500 and more tons of petroleum from the volcanic rock per day. Tyumen itself could envy such gushers! But even this "granary," as the oilmen refer to it, is still working at far from its capacity. The promising area has not yet been fully explored, and the required oilfield structures have not yet been built.

Correctly distributed manpower and resources and well-conceived tactics and strategy of development mean a great deal today to further development of Azerbaijan's petroleum and gas industry. A great deal, but not everything. We also need to have the resources to be distributed.

What we are implying is that first of all we must increase the drilling volume, which is obviously insufficient. In the 1960s an average of about 650,000 meters of rock were drilled per year on land in the republic, while today the figure is just a tiny bit more than 400,000. And yet, a direct relationship exists between tunneling distance and the quantity of fuel extracted. This basic truth is well known to the specialists.

At "Azneft'" we were acquainted with a plan for final development of the deposits on the Apsheron Peninsula. In order to get petroleum from the lower horizons, on the order of 7,000 new wells would have to be drilled. And the 1982 plan for the Apsheron Administration for Drilling Operations calls for only 70 wells. Any schoolchild can reckon without difficulty that at this rate, it would take at least a hundred years to finish the program!

An even more acute situation has evolved on the Caspian, where we are now basically drilling ultradeep wells.

One can hear in the ministries of petroleum and gas industry that growth in drilling volume and the associated outlays could be used to greater advantage in regions where the return is the greatest. But in Azerbaijan SSR, the increase in extraction per meter of drilled wells cannot be compared in any way with what West Siberia has to offer.

Without a doubt, the argument is a serious one: Apsherson today is not a Samotlor. But this comparison should be considered with caution, in our opinion, since it does not account for many important factors.

Extraction of petroleum and gas in Azerbaijan is closely associated with another industrial sector, also traditonal and large--petroleum refining and petrochemical industry. Its development requires a dependable raw material base. To pump millions of tons of petroleum to the Baku refineries thousands of kilometers from northern oilfields, as we do today, does not seem to be the best solution to the problem.

Nor can we discount the solid scientific and production potential of the republic and the highly rich experience of Azerbaijani oilmen, all of it oriented on petroleum. All of these factors allow us to look at the problem from a different point of view, to raise the issue of changing the attitude of union ministries and planning organs toward the urgent needs of this ancient oil land. And not at all from a sense of gratefulness for former services but on the basis of the land's real possibilities and prospects, with a consideration for all of the social and national economic factors.

We should obviously not forget that the situation that has evolved in this country may serve to some extent as a model for the future to the country's leading petroleum and gas extracting regions: After all, the time of the

gushers does not last forever. Some other old deposits are also approaching their "critical age." Problems concerning the petroleum and gas extractors of Azerbaijan may become the problems of other regions tomorrow. And if we are to solve them, we must prepare to do so today.

11004
CSO: 1822/70

BRIEFS

GAS PREPARATION FACILITY--The first integrated gas preparation facility is now under construction at the Davletabad-Donmez gas condensate deposit, the richest and perhaps the most promising in the republic. The low-temperature separation section is now being readied for operation. Brigades of Construction Administration No 3 of t e "Shatlykgazstroy" Trust are doing excellent work here. They are surpassing the quota set to commemorate Soviet Teacher's Week. One of the main prerequisites of the gas plant builders' rhythmical and coordinated labor is the presence of roads: After all, facilities of the "Turkmenneftegazstroy" Association are located in the desert as a rule, far away from cities and towns. Road-building subdivisions headed by S. Mel'nichenko and E. Banek are forcing construction of motor roads in Zaunguzskiye in the Central Kara-Kum Desert, considerably exceeding the daily quotas of the shock week. [By V. Malyshev] [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 3 Oct 82 p 2] 11004

NEW GAS WELL--Chardzhou--Laborers of the Exploratory Drilling Administration have prepared a remarkable gift to commemorate the 60th anniversary of the USSR's formation. Seven hundred thousand cubic meters of natural gas--such is the daily yield of well No 2, achieved during its testing at the Chertak site. The powerful flow of blue fuel sprung forth from a depth of about 3,000 meters, confirming the forecast made by geophysicists as to the promise of the bed. Thus a new gas deposit has been entered on the geographical map of the republic. The Chertak site is being developed intensively. The next well, which is being drilled by Hero of Socialist Labor Yu. Leont'yev's brigade, has already been dug down to the 4,200 meter mark. [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 13 Oct 82 p 2] 11004

VYAZEMSKIY RAYON GASIFIED--Khabarovsk--Gasification of towns in Vyazemskiy Rayon, a major bread-basket of the Amur region, has been completed. "The scale of gasification in the kray grew noticeably with the increase in oil flowing from Tyumen fields," said I. Rapoport, chief of the Khabarovsk "Kraygaz" Administration. "This made it possible for the Petroleum Refinery imeni S. Ordzhonikidze to increase production of propane-butane from petroleum refining byproducts. This gas is now being used extensively at industrial enterprises, and gas has become an irreplaceable source of heat for household needs out here, deep in the Far East. Now all towns along the Baykal-Amur Rail Trunkline and the settlements of fishermen, hunters and loggers are using economical gas stoves. Gas bottles are also being delivered to the most remote work areas of the logging enterprises." [Text] [Moscow GUDOK in Russian 2 Oct 82 p 1] 11004

OLD WELLS PRODUCING MORE--Laborers of the first oilfield belonging to the "Azizbekovneft'" Petroleum and Gas Extraction Administration are greeting the 65th anniversary of Great October with good successes in labor. Working the old Kalinskaya site, they are competently utilizing their reserves for stabilizing and raising the petroleum yield--something Comrade L. I. Brezhnev turned the attention of oilmen to in his speeches at the celebrations in Baku. In the last few days the brigade led by senior process engineer Pasha Aydamirov successfully assimilated well No 1500 and placed it into operation following completion of its drilling. It is now producing 8-10 tons of oil per day. The oilmen are devoting a great deal of attention to the old wells. Since the beginning of the year six wells have been placed back into operation following a long period of idleness. Two of them in the section serviced by foreman Akhliman Akhmedov's brigade--No 946 and No 815--have been found to be especially effective. The oilfield collective is distinguished by a thrifty attitude toward expenditure of resources. Recently for example air lift produced well No 1334 was converted to operation with an electric submersible pump in response to a proposal by foreman A. Akhmedov and operators Nikolay Engibaryan and Seidkyamil' Tagiyev. Its petroleum yield remained at its previous level, but 10,000 cubic meters of compressed air were saved. Now the oilfield collective is credited with 250 tons of petroleum and 45,000 cubic meters of gas extracted above and beyond the quota. Responding with good work to the October appeals of the CPSU Central Committee, the oilmen decided to extract another 100 tons of fuel in excess of the quota before the end of the year. [By S. Bagdiyan] [Text] [Baku VYSHKA in Russian 20 Oct 82 p 1] 11004

NORTHERNMOST GAS DEPOSIT--Yamburg, Tyumen Oblast--Industrial development of one of the northernmost gas deposits has been started at faraway Yamburg. Construction of drilling rigs, the machine units and parts of which were delivered while the northern seas were still navigable, has been started. By as early as the end of the five-year plan the gas field is to be finished at Yamburg. Meanwhile the gas that the first producing well provides will be used to heat the town in which the pioneer builders live. [Text] [Moscow TRUD in Russian 21 Oct 82 p 1] 11004

TURKMEN GAS DISCOVERY--Turkmen SSR--Geologists have discovered about 10 underground gas storehouses in the south of the Kara-Kum Desert. The first 7.5 million cubic meters of blue fuel are to be produced in 1983. A gas pipeline is already being laid, and construction of a primary gas refinery has begun. Drillers of the Turkmen SSR's Geology Administration are continuing their search for new sites at the Davletabad-Donmez deposit. [Text] [Frunze SOVETSKAYA KIRGIZIYA in Russian 19 Sep 82 p 2] 11004

POWER PLANT UNDER CONSTRUCTION--The trestle building brigades led by Vladimir Galkin and Nikolay Perevertov of the "Azmorneftegazstroy" Trust's Construction and Installation Administration No 2 are working hard during their labor watch dedicated to petroleum and gas extractors. Today at Neftyanyye Kamni in the vicinity of the town of Chvanov, they are erecting a huge reinforced concrete pile foundation upon which a 48,000 kilowatt gas turbine electric power plant will be built. The plans drawn up by institutes of the "Gipromorneftegaz" and the Moscow "Sel'energoproekt" foresee outfitting the station with economical equipment and an automatic system that will ease the work of service personnel. According to tentative estimates its fuel consumption will be twice less than

that of the presently existing steam turbine power plant. The first generation of the new plant is to be placed into operation by as early as next year. Later on it will provide electric power not only to the economy of Neftyanyye Kamni but also to an offshore oilfield that is developing quickly at the promising deposit imeni 28 Aprelya. Things are going well at the facility: The daily output norm is 130-135 percent. This work pace will make it possible for the builders to have the site ready for installation of the production equipment by the Soviet state's jubilee. [By V. Gol'tsev] [Text] [Baku VYSHKA in Russian 18 Sep 82 p 1] 11004

WEST SIBERIAN DEEP WELLS--Tyumen Oblast--The dispatcher service of the Tyumen Oblast Geological Administration has entered a seven-digit number into the deep well drilling report. Explorers of the subsoil reached the cherished millionth meter a month sooner than last year. Wells penetrating the promising underground beds of West Siberia represent potentially new deposits of petroleum, gas and condensate. The drillers worked themselves into glory: About one out of every two brigades of the main administration completed the annual plan, and 22 collectives also satisfied higher pledges in honor of the 60th anniversary of the USSR. Specialists of the "Ob'neftegazgeologiya" Association did especially much for the common victory. Drilling brigades headed by drilling foremen V. Solov'yev. A. Kamyshin, V. Khvostov and N. Aksarin achieved the best indicators here. [By Yu. Perepletkin] [Text] [Moscow IZVESTIYA in Russian 26 Sep 82 p 2] 11004

GAS PRODUCTION TARGET--"Increase the gas extraction total to 500 billion cubic meters by the 60th anniversary of the USSR's formation": This is the appeal with which the collective of the Zapadno-Shatlykskiy Production Operations Service led by Communist N. M. Tolstikov turned to the country's gas extractors. The initiative of the Turkmen gas extractors was approved by the USSR Ministry of Gas Industry and by the presidium of the sector's trade union central committee, and it is enjoying broad support. The collective of the Zapadno-Shatlykskiy Production Operations Service is the best in the "Shatlykgazdobycha" Production Association, and the leader of the socialist competition among subdivisions of the "Turkmengazprom." People of various nationalities work in this collective, which has earned its lofty title of a collective of communist labor. Since the beginning of the five-year plan this production operation's service extracted more than half a billion cubic meters of inexpensive natural fuel in excess of the plan from the subsoil of Karakum. This collective is credited with 12 efficiency proposals, of which 8 have already been introduced into production with an economic impact of more than 15,000 rubles. They are all oriented toward improving the gas preparation system, modernizing the production equipment and making laborious processes easier. [By N. Karliyev] [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 20 Oct 82 p 1] 11004

WELL DRILLING PROGRESS--Neftechala--The brigade led by foreman Seydgasan Kyazimov of the Neftechala Drilling Operations Administration completed its annual quota back in the start of September. Reinforcing its success, the leader of the competition finished drilling well No 1047 ahead of schedule this week. This well started production with a yield of 35 tons of petroleum and 20,000 cubic meters of gas per day. Drillers Il'yas Memedov and Alisafa Fatullayev, assistant driller Mirzakhir Amirov, fitter Mamed Ragimov, electrician Mazaim Asadov and others distinguished themselves especially during the drilling of the well. In all since the beginning of the year, S. Kyazimov's brigade made five wells ready for the oilmen, and most of them ahead of schedule. Owing to efficient organization of labor, good care of the equipment and strict compliance with the drilling conditions, the collective increased its commercial drilling rate to 675 meters per rig per month. The level of their productive time was 98.2 percent--the highest indicator for the administration. Striving to greet the 65th anniversary of Great October and the 60th anniversary of the USSR's formation with honor, the brigade has pledged to drill another 1,000 meters of wells in excess of the plan. [By D. Gezalov] [Text] [Baku VYSHKA in Russian 23 Oct 82 p 1] 11004

PETROLEUM INDUSTRY CONFERENCE--Discovered a few years ago in Azerbaijan, the Muradkhanly oilfield provides more than 700,000 tons of petroleum. But its industrial exploitation and exploration and drilling of new wells in this region are taxed by a number of serious difficulties: The beds in which the petroleum lies consist of rock riddled by cracks. Such porous rock also dominates the Zardobskiy deposit discovered in 1981. And on the territory of the USSR as a whole there are more than 200 such deposits. They are located mainly on the Ural, in West Siberia, in Central Asia and along the Volga, and the proportion of the petroleum they are supplying is constantly growing. The problems of assimilating such deposits and the ways of improving exploration, drilling and oil extraction at these deposits are being discussed at an all-union scientific-practical conference that began its work on 12 October in the Azerbaijan SSR Scientific Research and Planning Institute of Petroleum Industry. Representatives of more than 30 scientific institutions and production associations located in all corners of the country convened together for the conference. The introductory remarks were given by the director of the petroleum industry institute, Corresponding Member of the Azerbaijan SSR Academy of Sciences M. K. Seid-Rza. On that same day, following the plenary meeting, work was started in four sections: geology, drilling, deposit development, petroleum extraction equipment and procedures. [Text] [Baku VYSHKA in Russian 13 Oct 82 p 4] 11004

OIL WELL REPAIR--Guryev Oblast--Led by Kazakh SSR State Prize laureate M. Anshibayev, the underground repair brigade of the "Dossorneft'" Administration has restored 50 more wells than planned this year. The collective headed by K. Mukhambetkaliyev is also repairing wells with high quality and ahead of schedule. Owing to the highly productive shock work of the repairmen, the oilmen of the administration have already managed to surpass the plan by 800 tons of petroleum. [By B. Glotov] [Text] [Moscow SOTSIALISTICHESKAYA INDRUSTRIYA in Russian 22 Oct 82 p 1] 11004

OFFSHORE EXPLORATORY WELL--Baku--The collective of the "Baky" self-elevating floating drilling rig is drilling well No 6 far from shore. The petroleum and

gas content of Mesozoic reef formations will be explored by this well. This is a new direction in petroleum and gas explorations being conducted in the Caspian Sea. The oil prospectors are now starting a critical operation--lowering a heavy casing to a depth of almost 4,000 meters. It will line the unstable rock and flooded beds, making it possible to drill down further to 6,000 meters. The collective is working at a forced pace. Work on the basis of a brigade order, efficient organization of labor and high discipline are making this possible. Boldly storming the petroleum and gas-bearing depths of the Caspian, the explorers of the subsoil are preparing for an honorable welcome to the 65th anniversary of Great October and the 60th anniversary of formation of the Union of Soviet Socialist Republics. [By L. Tairov] [Text] [Moscow PRAVDA in Russian 3 Oct 82 p 1] 11004

STEEL DRILLING EQUIPMENT CONFERENCE--Sumgait, 30 September--The problems of upgrading the quality of steel smelting were discussed at a scientific-practical conference in which representatives of the Taganrog Metallurgical and the Seversk and Chelyabinsk tube-rolling mills and five all-union scientific research institutes of ferrous metallurgy took part together with metallurgists of the Azerbaijan SSR Tube-Rolling Mill imeni V. I. Lenin. The possibilities of improving the technological and operational properties of tube-rolling steel and of reducing consumption of raw materials and intermediate products were examined. Orienting themselves on the tasks posed to the oilmen of Azerbaijan by Comrade L. I. Brezhnev during his visit to Baku, the conference participants devoted special attention to increasing production of steel pipes for deep and ultradeep drilling capable of withstanding low temperatures and a caustic environment. [Text] [Baku VYSHKA in Russian 1 Oct 82 p 3] 11004

FLEXIBLE TUBING SYMPOSIUM--The ship with the name "Ali Amirov" is well known to Caspian oilmen. Intended for the drilling of wells for geological engineering purposes, it has become a dependable helper to the explorers of the subsoil searching for fuel beneath the seabed. The "Ali Amirov" is drilling exploratory wells with the help of flexible tubing produced by France's "Kofleksip" [transliteration]. These unique hoses, which are made from steel and synthetic materials, have a large number of advantages over rigid piping. They are resistant to corrosion, and they are easily hooked together and laid beneath the water. The elastic tubing, the diameter of which goes as high as 450 milimeters, can be added onto endlessly. And it can withstand a pressure of up to 1,500 atmospheres. The problem of using flexible pipelines in the extraction of oil and gas at sea was the topic of a symposium that convened in Baku on 5 October. It was organized by the Franco-Soviet Chamber of Commerce and "Kofleksip" in cooperation with the Azerbaijan SSR Chamber of Industrial Commerce. "We came to Baku," said the company's vice president Zhan Pol' Ober, "to develop our contacts with Soviet oilmen further. The USSR is making a large-scale effort to develop the sea shelf. This problem is also in the center of attention of our country. Common objectives are the basis of our mutually advantageous cooperation." Zh. Ober believes that flexible pipelines acquire special significance with growth in depth, which is what the oilmen are experiencing now. Moveable platforms broadly employed under these conditions, he said, can be connected much more conveniently with well heads by hoses than by conventional piping. The vice president of "Kofleksip" expressed the hope that the symposium in Baku will promote stronger ties between Soviet and French scientists and specialists concerned with development of offshore fuel deposits. The program of the symposium, which will last 3 days,

includes lectures and discussions on various aspects of creating and using flexible pipelines. [Text] [Baku VYSHKA in Russian 6 Oct 82 p 4] 11004

TASBULAT DEPOSIT OPERATIONAL--Shevchenko--Mangyshlak oilmen placed the new Tasbulat oilfield into operation a quarter ahead of schedule. Yesterday the first tons of crude began flowing through the multikilometer pipeline to the seaport of Aktau, where it will be loaded onto tankers that will carry it to refineries. A joint work contract signed by drillers, builders and operators promoted the faster assimilation of the petroleum deposit. [Text] [Moscow TRUD in Russian 9 Sep 82 p 1] 11004

COUPLING TOOLS--Nebit-Dag--A consignment of new coupling turning tools has been sent by the Tbilissi Machine Tool Building Plant to the pipe and tool base of the "Turkmenneft'" Production Association. These tools are intended to produce hermetically sealed drilling pipe couplings. The new automatic equipment can significantly improve the quality of the work and insure an increase in labor productivity. [By Z. Rzayev] [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 29 Aug 82 p 4] 11004

CORROSION INHIBITOR PROPOSED--Discovery of gas deposits containing hydrogen sulfide has made corrosion protection of the equipment of wells, compressors and pipelines a difficult problem. Colleagues of the USSR Academy of Sciences Institute of Physical Chemistry studied the mechanism of hydrogen sulfide corrosion and the ways of preventing it, and they proposed a new highly effective combination inhibitor and antifoaming agent, which they named ifkhangaz. It provides effective corrosion protection at insignificant concentrations. [By I. Potapov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Sep 82 p 2] 11004

COMPETITION LEADERS--Neftekumsk, Stavropol Kray--Oilmen of Stavropol Kray surpassed the plan by 30,000 tons of petroleum and more than 11,000 cubic meters of gas in their shock watch in honor of the 60th anniversary of the USSR's formation. The leaders of the competition include the collectives of the Neftekumsk Drilling Operations Administration, the Stavropol Petroleum and Gas Extraction Administration and the Budennovsk Technological Transport Administration. [By I. Shlyakhtin] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Sep 82 p 1] 11004

GAS DELIVERIES UP--Shevchenko--Kazhakstan's gas field operators are increasing the yield of natural gas. Yesterday the collective of the Mangyshlak Gas Extraction Administration delivered its 75-millionth cubic meter of fuel in excess of the plan to the main pipeline leading from Central Asia to the country's center. The entire increment was achieved through fuller utilization of the wells. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 19 Sep 82 p 1] 11004

'KUMDAGNEFT'' PRODUCTION FIGURES--The collective of Shop No 4 of the "Kumdagneft'" Petroleum and Gas Extraction Administration are marking each shock labor week in honor of the USSR's jubilee with high indicators. Since the beginning of the year it has surpassed the plan by 15 million cubic meters of gas, which is much more than they had pledged, and over 4,000 tons of liquid fuel. The oilmen attained such a high point owing to implementation of geotechnical measures aimed at achieving trouble-free operation of all existing wells. The petroleum and gas extractors received three new wells from the drillers at the Gograndag and Erdekli sites and placed them into operation. Now another five wells are being prepared here. They will be placed into operation in the next few days. The collective of this leading shop must also assimilate wells drilled at the gas condensate site of the Ekizak deposit and place them into operation. The oilmen are not resting with their achievements. They are seeking unutilized reserves for raising labor productivity and work quality. Oilman-operators Kurbanmengli Niyazmengliyev, Redzhep Mamedgel'dyyev, Mered Yanykov and Amanyaz Chapyyev are distinguishing themselves in the socialist competition for an honorable welcome to the 60th anniversary of the USSR's formation. [By N. Nurgel'dyyev] [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 22 Oct 82 p 1] 11004

CSO: 1822/70

KAZAKH ELECTRIC POWER DEVELOPMENT

Moscow ENERGETIK in Russian No 9, Sep 82 pp 20-22

/Article by B.P. Ivanov, KazSSR Minister of Power and Electrification: "The Development of the Electric Power Industry in the Kazakh SSR Over the Past 60 Years"/

/Text/ The Kazakh SSR, a highly developed agroindustrial republic, occupies a worthy place in the unified formation of the USSR's socialist republics.

The industrial face of the republic cannot be represented without such giants as the Karagandinskiy metallurgical combine, the Ust'-Kamenogorskiy lead and zinc and titanium and magnesium combine, the Sokolovsko-Sarbayskiy enrichment combine, the Balkhashskiy and Dzhezkazganskiy mining and metallurgical combines, the Dzhambulskiy and Chimkentskiy phosphorous combines, the Pavlodarskiy tractor combine and refineries, the mines of Karaganda and the coal basins of Ekibastuz, and the oil fields of Mangyshlak and Buzacha. Industry accounts for more than half of the republic's national income. The Kazakh SSR is among the leaders in the USSR as far as the average annual growth of industry is concerned; the amount of industrial product increased by 39 to 43 percent during the 10th Five-Year Plan.

Kazakh SSR has become a leading grain producer in the Soviet Union and a major livestock breeder. At present the republic's state farms and collective farms are large, economically secure and highly mechanized farms, which provide the state with grain, meat, milk, wool, vegetables, potatoes, and other agricultural products.

The unseen flowering of the five-time winner of the order of Soviet Kazakhstan, which has just celebrated its sixtieth anniversary, has been possible due to the assistance provided by the brotherly peoples of the USSR and primarily the Great Russians. The roots of the economic, social and cultural ties between the Russians and the Kazakhs are to be found in the distant past. In 1982 some 250 years have passed since the voluntary annexation of Kazakhstan to Russia.

The October Revolution created essentially new conditions for the conversion of the kray. A clear example of this is the development of power and electrification in the Kazakh SSR during the years of Soviet power.

Prior to the revolution the republic's power base was at a very low level of development even in comparison with the other outlying districts of the industrially backward czarist Russia. The few power units served the needs of individual enterprises, largely the small mining plants in Gornyy Altay and central Kazakhstan.

The Russian capitalists and foreign concessionaires equipped power units only where they would provide the maximum profit. Only six cities in Kazakhstan had their own power stations of any size (in Pavlodar, for example, there was a 20 kW unit). The consumption of electricity per capita was only 1.5 kW-hour per year in prerevolutionary Kazakhstan.

Today's level of power in Kazakh SSR was the result of the wise Leninist national policy of the party.

The development of the Kazakh SSR's power system is based upon the use of various internal power resources.

The republic's power industry was essentially started in 1928, when Lenin's Goelro plan was created and led to the introduction of the first large for that time hydroelectric power station - the Kharnuzovskaya GES with a rated capacity of 3,000 kW. This veteran of the Kazakh SSR's power industry is still in operation.

Prior to the start of the First Five-Year Plan the total rated capacity of the Kazakh SSR's power stations reached 9,000 kW and the generation of electricity amounted to 7 million kW-hours.

The development of the Kazakh SSR's power industry during the prewar five-year plans promoted the rapid growth of industrialization within the republic. Rather powerful electric power stations for that time were built along with the large industrial enterprises.

In 1931 the decision was made to develop the Karagandinsky coal basin, which marked the beginning of the creation of a fuel and energy sector and of the development of industry in central Kazakhstan.

An appropriate power base was required for the newly completed industrial enterprises.

In 1932 the Karagandinskaya TsES with a rated capacity of 11,000 kW was put into operation. In 1935 the first steam turbine general purpose power station - the Alma-Atinskaya TsES - was put into operation. This power station remained the only source of power for the capital of the republic until 1944.

The development of the Kazakh SSR's power industry during this period took place on the base of the construction of power stations, which operated in isolation and, as a rule, were included within the industrial enterprises.

Subsequent years are characterized by the formation of power units and the construction of power sources that were increasingly powerful.

In 1937 the Kazakh SSR's first large thermal electric power station - the Balkhashskaya TETs - was put into operation; this power station was equipped with 25 MW turbounits, which were quite modern for that time. In this same year in Eastern Kazakhstan the Ul'binskaya GES with an installed rated capacity of 27.6 MW was put into operation. With the start up of this power station and the completion of the first 110 kV power transmission line between the Ul'binskaya GES and Leninogorsk, the first power system (now called the Altayskaya system) came into being in the Kazakh SSR.

In 1940 the rated capacity of Kazakh SSR electric power stations was already 224,000 kW, and the generation of electricity was 630 million kW-hours. For that time this was a rather powerful electric power base. During the war the republic along with the Urals, Siberia and Central Asia was converted into an arsenal for victory. Large machine building plants, which within a very short period of time were manufacturing products for the front, were moved into the Kazakh SSR from the temporarily occupied regions of the Soviet Union.

The unselfish labor of the Kazakh power workers within a very short period of time resulted in the further growth of the energy base and a significant increase in the generation of electricity. In most difficult conditions in 1942 the Karagandinskaya GRES-1 was put into operation. The start-up of this station made it possible to double the extraction of coal at Karaganda mines, coal which the nation needed so desperately. Also in 1942 the second large thermal electric power station - the Aktyubinskaya TETs - was put into operation. This made it possible to undertake the production of ferroalloys, which are so critical for defense.

During the war years another 160,000 kW of new power capacities were put into operation in the Kazakh SSR. The installed rated capacity of the republic's electric power stations reached 382,500 kW in 1945; and the generation of electricity reached 1,148 million kW-hours.

The postwar years for the Kazakh SSR's power industry were a period of great changes. From 1945 through 1959 the Ust'-Kamenogorskaya GES and TETs, the Dzhezkazganskaya TETs, the Ozernaya GES-1 and GES-2, the Tishinskaya GES, and others, were put into operation.

The existing Karagandinskaya GRES-1 and Balkhashskaya TETs, the thermal power stations of several plants, the Kentausskaya TETs, and others were significantly expanded. During the years 1959 through 1965 nineteen new steam turbine power stations with a total rated capacity of 1,726,000 kW were built; the Bukhtarminskaya GES reached its projected rated capacity (675,000 kW) and many existing stations, which used equipment for high steam parameters, were expanded.

A decisive factor, which ensured the unprecedented rapid growth in the Kazakh SSR's power industry, was the switch to the sectoral system of management. With the creation in 1962 of the KazSSR Ministry of Power and Electrification the electric power stations and individual power units were joined together into large power systems. By 1971 nearly all of the KazSSR Minenergo's power stations and plant power stations were joined together in parallel work.

By the end of 1965 the republic's power stations had a rated capacity of 6,215,000 kW and the generation of electricity exceeded 19 billion kW-hours.

Significant amounts of work were accomplished in the 8th Five-Year Plan. During this period of time within the republic the Petropavlovskaya TETs-2, the Alma-Atinskaya GRES, the Karagandinskaya GRES-2, the first 200,000 kW power units at the Dzhambuulskaya GRES and the 300,000 kW power units at the Yermakovskaya GRES were put into operation.

In the 9th Five-Year Plan the Yermakovskaya GRES (2,400,000 Kw) and the Kapchagayskaya GES (434,000 kW) reached their projected rated capacities. The first section of the Pavlodarskaya TETs-3 was put into operation; and the construction was started on the first element of the Ekibastuz fuel and power complex - the Ekibastuzskaya GRES-1. Work continued on a broad basis to construct electrical and heating network systems.

The development of the republic's power industry at a modern stage is characterized on the whole by the growth in new power capacities, a rise in the level of the centralized production of electricity, the adoption of progressive technological processes, an improvement in the structure of power station equipment, and the further development of the power systems.

The installed rated capacity of all Kazakh SSR power stations by the end of 1980 exceeded 13.5 million kW and the generation of electricity was 61.5 billion kW-hours.

In the 10th Five-Year Plan Kazakh SSR Minenergo power stations received more than 2.3 million kW of new power capacities. The Ekibastuzskaya GRES-1, the Karagandinskaya TETs-3, the Tselinogradskaya TETs-2, and the Alma-Atinskaya TETs-2 were put into operation. Existing power stations including the Dzhambulskaya GRES, the Pavlodarksya TETs-3 and others attained their planned capacities.

During the years of the 10th Five-Year Plan the structure of thermal electric power stations, which form the basis of the Kazakh SSR's power industry, was significantly changed. The percentage of power stations with a rated capacity in excess of 500,000 kW rose to 55.6 percent; and those with a rated capacity in excess of 1,000,000 kW rose to 48.5 percent of the total rated capacity of TETs.

There was an increase in the per-unit capacity of power units. The percentage of 200-500 MW turbounits in the total installed rated capacity of the TETs reached 48.5 percent in 1980. All stations of the Ekibastuz fuel and power complex will receive 500 MW power units.

Work is proceeding on a large scale to construct system power transmission lines and to strengthen the intersystem connections. At present the total length of power stations of all voltages has reached almost 350,000 km, including 35 kV and higher lines - nearly 93,000 km, of which there are more than 14,000 km of 220 to 500 kV power lines.

Of the ten power systems operating in the republic, six - Altayskaya, Karagandinskaya, Kustanayskaya, Pavlodarskaya, Tselinogradskaya and Ekibastuzskaya - have been linked together in parallel operation to form the Northern Kazakhstan Unified Power System (OES). The Alma-Atinskaya and Yuzhno-Kazakhstanskaya power systems now form the Central Asian OES. Gur'yevenergo and the Ural'skiy power unit Zapkazenergo now form the Central Volga OES. And finally, the Aktyubinskiy power unit of Zapkazenergo is part of the Urals OES. Through the OES of Northern Kazakhstan along 500 kV lines a connection is formed linking the Siberian OES with the Unified Power Grid of the USSR.

Much has been done in the republic to centralize the supply of power for agriculture. In 1980 alone nearly 15,000 km of power transmission lines were built and put into operation; these lines carried all voltages. By the start of the 11th Five-Year Plan the length of the networks at all voltages to be used by agriculture was about 317,000 km. At present all regional centers of the republic have been connected with the state power systems; this includes the grain receiving enterprises and the central farms of all sovkhozes and kolkhozes.

Switching farms to a central supply system has made it possible to disassemble and put into reserve more than 10,000 small, uneconomical diesel electric power units and to free more than 20,000 maintenance men for other agricultural tasks. At present the annual consumption of electricity in agriculture has reached 7.5 billion kW-hours.

Within the republic a great deal of work has been done to centralize heating for industry and cities. The most efficient aspect of this has been central heating, which has been developed on a significant basis within the republic.

The generation of heat in the republic from 1962 through 1980 has increased more than 11-fold. More than 1,500 small uneconomical boilers have been shut down and almost 9,000 maintenance men have been freed for other work; the air around the cities has become cleaner.

At present 32 cities and workers' settlements in the republic receive heat from centralized sources.

The rise in the technical level of electric power stations within the republic can be attributed to both the introduction of modern equipment and the modernization of existing equipment. The total economic savings from modernization and rebuilding of existing equipment in the years 1963 through 1980 has exceeded 21 million rubles.

A significant amount of work is being done at republic power stations to protect the environment from harmful emissions. Without exception all boilers which burn coal have been equipped with ash removal units; and several TES's now have or soon will have facilities for cleaning industrial wastes.

The management of the republic's power industry is constantly being improved on the basis of automated control systems (ASU).

In the 10th Five-Year Plan the first ASU P sections were put into operation at the Alma-Ataenergo, Tselinenergo, Pavlodarenergo, Yuzhkazenergo, Kustanayenergo; and ASU TP at the Yermakovskaya GRES; an ASU TES at the Dzhambulskaya GRES; and the first section of the republic sectoral automated control system (ROASU) "Energiya".

In the 11th Five-Year Plan, as during the previous years, the primary trend in the development of the Kazakh SSR's power industry is the concentration of power station capacities, the obtaining of inexpensive electric power, which is generated by burning low grade solid fuel from the Ekibastuz deposit.

The main power construction undertaking within the republic is the unique Ekibastuz fuel and power complex (ETEK). The total capacity of the complex's electric power stations will amount to 20 million kW. At the leading project of the ETEK - the Ekibastuzskaya GRES-1 - they have already started up four 500,000 kW power units.

In the 11th and 12th five-year plans the Ekibastuzskaya GRES-2, GRES-3, GRES-4, and the Yuzhno-Kazakhstanskaya GRES with a projected rated capacity of four million kW each will be put into operation. Existing thermal electric power stations will be expanded and new hydroelectric power stations will be built. Altogether the republic plans to put into operation more than 20 million kW of new power capacities at power stations.

To supply capacity from the Ekibastuz electric power stations it is necessary to build and put into operation power transmission lines capable of carrying high and superhigh voltages. The most powerful of these lines will be the direct current power transmission line between Ekibastuz and the Center, with a voltage of 1,500 kV and covering a distance of 2,400 km. An intersystem power line will be built for an alternating current with a voltage of 1,150 kV between Siberia, Kazakh SSR, and the Urals. The first sector will be the

sector running between Ekitbastuz-Kokchetav-Kustanay-Chelyabinsk, a distance of 1,345 km. The introduction of this power transmission line will provide a reliable and uninterrupted supply of power to the northern regions of the Kazakh SSR and the southern Urals. The 1,500 kV direct current line and the 1,150 kV alternating current power line will become the basis for forming a unified network of superhigh voltages for the Soviet Union.

To cover the loads of the rapidly developing Karatau-Dzhambulskiy production complex, the republic capital of Alma-Ata, the Alma-Atinskaya and Taldy-Kurganskaya oblasts, and also for connecting the Central Asian OES with the Unified Power System of the USSR, in the 11th Five-Year Plan we will build power transmission lines at 500 kV between Agadyr'-Yuzhnokazakhstanskaya GRES - Alma-Ata for a distance of 670 km. Later we will build a power line between Frunze-Alma-Ata and the Yuzhnokazakhstanskaya GRES-Dzhambul-Chimkent.

Central heating will be developed further, which ensures a significant reduction in the relative expenditures of fuel. During the 11th Five-Year Plan alone it is planned to complete nearly 1,000 MW of new heating capacities. The output of heat from the heating plants of the KazSSR Minenergo in 1985 will reach 60 million Gcal.

For the comprehensive solution of the national economic tasks for irrigation, shipping, fishing and the production of electricity based upon renewable sources of energy we are constructing the Shul'binskaya GES - the third station in the Irtysh River cascade. The assemblies of its first section with a projected rated capacity of 702 MW will be ready by the end of the 11th Five-Year Plan. Later on the Shul'binskaya GES will achieve its full projected rated capacity of 1,350,000 kV.

Special mention must be given to the fact that as the Soviet Union's power industry enters a new stage in the development of the Unified Power System, when opportunities are being created to include all energy producers and consumers within this system, the importance of the Kazakh SSR will increase sharply. This was heavily emphasized by the 26th CPSU Congress and the 15th Kazakh SSR Party Congress, which noted the high levels of power construction within the republic. The installed rated capacity of the republic's power stations by the end of the 11th Five-Year Plan must reach 20.4 million kW and the generation of electric power - 90-95 billion kW-hours, which will make it possible for us not only to meet our needs but also to supply more and more electricity outside the limits of our republic.

8927
CSO: 1822/50

LITHUANIAN ELECTRIC POWER DEVELOPMENT

Moscow ENERGETIK in Russian No 9, Sep 82 pp 23-24

/Article by Yu. M. Nekrashas, chief of the Main Production Administration of Power and Electrification of the Lithuanian SSR: "The Electric Power Industry of the Lithuanian SSR"/

/Text/ If you look at the path taken by the republic's power industry during the years of Soviet power - years marked by war and rebuilding for nearly one fourth of the total amount of time - and compare today's achievements with the legacy given us by the bourgeoise, the figures alone demonstrate that our republic has done a great deal to increase power capacities and to create a large power system and to electrify the entire republic's national economy.

During the years that the bourgeoise were in power in Lithuania the republic was at the bottom of the list in the production of electricity in Europe. The total capacity of electric power stations (not counting plant power stations) in 1940 was only 53,300 kW. According to statistical data in 1939 there were only 96 electric power stations (excluding the Vil'nyusskaya and Klaypedskaya oblasts) in Lithuania. All of these stations operated in isolation and belonged to various departments and capitalists. In 1939 no more than 20 kW-hours of electricity were generated per resident.

The government of bourgeoise Lithuania was not concerned about the development of the power industry. A foreign company held the concession for the largest Kaunasskaya electric power station; this company was given a monopolistic authority for providing electric power to the then capital of Lithuania.

The largest electric power station was the Petrashunayskaya (Kaunas) power station, which had a total rated capacity of 16,400 kW. The rated capacity of the Vil'nyusskaya power station was 8,500 kW, of the Rekivskaya - 2,500 kW, the Bachyunskaya 2,200, and the Panevezhskaya - 930 kW.

In 1944 the fascist troops, while retreating from Lithuania, destroyed almost all of the largest electric power stations. Hitler's soldiers did not manage to blow up the Rekivskaya, Bachyunskaya and several small municipal and industrial power stations. The total rated capacity of the remaining power stations amounted to 5,000 kW. In essence it was necessary to completely rebuild the republic's power industry.

Rebuilding work was started at the Klaypedskaya, Vil'nyusskaya and Petrashunayskaya power stations. In this same year two power units were put into operation at the Klaypedskaya GRES with a total rated capacity of 4,500 kW. In 1946 one turbounit was installed at the Petrashunayskaya GRES (3,200 kW) and another unit was installed at the Vil'nyusskaya GRES (1,800 kW).

Thanks to the brotherly assistance of the Soviet republics the prewar rated capacity of the power stations was achieved in 1950 and the level of electric power production was achieved in 1948.

At the same time that the rebuilding work was in progress, existing power stations were being modernized and expanded. In 1948 construction of the Vil'nyusskaya TETs-2 was started; the rated capacity of this station's power unit was 12,000 kW and it was put into operation in 1951. The projected rated capacity of the power station - 48,000 kW - was achieved in 1957. The total installed rated capacity of all of the republic's power stations at the end of 1958 was 273,000 kW. The largest power stations at that time were the Petrashunayskaya GRES (60,500 kW) and the Vil'nyusskaya TETs-2. Both of these power stations burned peat.

In 1955 construction got underway on the republic's largest hydroelectric power station - the Kaunasskaya GES on the Neman River. The first two hydrounits were put into operation in 1959; in 1960 the Kaunasskaya GES achieved its projected rated capacity of 90,000 kW. Only under Soviet power did it become possible to accomplish the long-time dream of the Lithuanian people - to conquer the waters of the Neman River. The construction of the GES saved Kaunas from the spring floods, which almost yearly caused great damage to the city.

With the start-up of the Kaunasskaya GES the generation of electric power within the republic increased. But there clearly was not enough to meet the needs of the rapidly developing industry, agriculture, and the growing municipal and household needs of the population.

A key moment in the development of the power capacities of the republic was the decision to build a thermal condensation electric power station - the Litovskaya GRES with a rated capacity of 1,800,000 kW. Construction of this power station began in 1960.

As the result of the diligence of the builders and installers the first power unit of this station with a rated capacity of 150,000 kW was put into operation in 1962; the eighth and final unit with a rated capacity of 300,000 kW went on line in 1972.

With the completion of the Litovskaya GRES imeni V.I. Lenin the shortage of electricity in Lithuania was eliminated and we began sending our surplus to other republics.

In recent years in order to supply Kaunas and the petroleum refinery with central heating two thermal electric power and heating plants were put into operation - the Kaunasskaya TETs with a rated capacity of 170 MW and the Mazheyskaya TETs with a capacity of 160 MW. Equipment with steam parameters of 140 kgf/cm^2 and 560 degrees C was installed at these plants.

By the start of 1982 the installed rated capacity of the power system's stations was 2,402 MW, of which 96 percent is provided by thermal electric power stations and four percent comes from hydroelectric stations. The annual generation of electric power by all of the system's power stations reached 11.7 billion kW-hours in 1981.

All of the thermal electric power stations, with the exception of the Litovskaya GRES imeni V.I. Lenin, operate in a central heating mode. In 1981 the average relative expenditure of conventional fuel for the system for electricity generated was 328.6 g/(kW-hour); for thermal power this figure was 168.2 kg/Gcal.

Considering the scale and importance of the fuel and power complex in the USSR national economy and the fact that the republic's thermal power industry is based upon fuel that is shipped in from outside, the task to do everything possible to conserve power resources becomes critical. An effective way of conserving primary power resources at present is to centralize heating in the republic by constructing large regional boilers in the cities. In this realm specific positive results have been achieved.

The introduction of large condensation units at the Litovskaya GRES imeni V.I. Lenin and the connection of the Litovskaya power system to the Northwest Unified Power Grid (OES) have made it possible to modernize the existing thermal electric power stations in the cities in order to use them for centrally heating the national economy.

At present in 18 of the republic's cities some 74.2 percent of the housing units have central heating. The power system now provides more than 50 percent of the republic's requirements for thermal energy.

At the same time that power capacities were being increased at power stations, electric power networks of all voltages were being developed.

In 1955 the first VL 110 KV was put into operation between the Petrashunayskaya GRES and Panevezhis; this power transmission line linked the Kaunas power junction with the Panevezhsko-Shyaulyayskiy power junction. And in 1958 a VL 119 kV was built between Kaunas and Vil'nyus. In 1960 the introduction of a VL 110 kV line between Kaunas, Gusev, Sovetsk, and Klaypeda (through the Kaliningradskaya power

system) marked the completion of the linking of all of the republic's power stations into parallel operation. In 1961 the Northwest power system was connected with the OES along with the introduction of the of the Riga-Shyaulyay VL 330 kV line. Now 110 and 330 kV power transmission lines join the Litovskaya power system with the Latviyskaya, Belorusskava and Kaliningradskaya power systems.

The intensive construction of distribution 10 kV networks and low-voltage power transmission lines is connected with the electrification of agriculture within the republic; this work was started in 1954. By the end of 1964 all farms were supplied with electricity from the power system. For this nearly 35,000 km of rural .4 and 10 kV power lines were built.

All 10 kV and above power lines, and also more than 90 percent of the .4 kV power lines, were built on reinforced concrete supports, the adoption of which was begun in 1958.

The electrification of industry, transport, municipal and agriculture within the republic has made it possible to modernize their technical base, to intensify production processes, to raise labor productivity, and to improve the working and living conditions of the population. The consumption of electric power per resident per year has increased over the past twenty years. While in 1960 this indicator amounted to 400 kW-hour per resident, in 1970 this figure was 1,650 kW-hours and in 1980 it reached 3,370 kW-hours per resident.

The percentage of consumption of electric power by industry within the overall structure of power consumption is gradually decreasing due to the rapid growth in consumption by agriculture.

The largest consumers of electric power are the chemical industry, machine building, the production of construction materials, the timber and celluose-paper, light and food industries.

The development of the electric power industry has made it possible to create new power-consuming sectors of the economy. In 1952 the first cement was produced by the Akmyanskiy plant. In 1963 the Kedaynyayski, chemical combine began to produce. In 1965 the Ionavskiy nitrogen fertilizer plant and the Kaunasskiy artificial fiber plant imeni Fifty Years of the October Revolution became operational. And in 1980 the Mazheyskiy petroleum refinery was put into operation.

During the past ten years the consumption of electricity for agricultural needs increased from 663.3 million kW-hours in 1970 to 2,399 million kW-hours in 1980. The total amount of electricity available to agriculture within the republic has increased from 6.5 million HP (1970) to 11.8 million HP (1980).

As agriculture is mechanized there is a sharp increase in the amount of electric power that is consumed directly for the production needs of this sector of the national economy. Over the past twenty years the consumption of electric power in agriculture has increased 30-fold. Some 75 percent of the energy provided to agriculture is used for production processes. The amount of power available to labor in agriculture has almost doubled every five years, reaching 5,500 kW-hours in 1980.

At the end of 1980 the total length of rural power transmission lines at voltages of 10 kV and below reached 100,000 km; the rated capacity of the transformer substations exceeded 2.8 million kV amperes. At present there are 390,000 electric motors with a total capacity of 2.3 million kW in use in agriculture.

At present within the republic there are several leading farms, which consume more than 10 million kW-hours of electricity every year. For example, the Vil'nyusskiy "Pagiryay" hothouse combine consumes some 12.5 million kW-hours, the Vil'nyusskiy poultry farm consumes some 13.4 million kW-hours, and the kolkhoz imeni Michurin in Kaunasskiy rayon consumes some 10.6 million kW-hours.

During the past twenty years the consumption of electricity by the municipal and household administrations of cities has increased more than 6-fold, reaching one billion kW-hours in 1980. In 1960 this amount of electric power sufficed to meet the needs of the entire republic's national economy.

The achieved level of industrial development, agriculture, culture, and improvements in living conditions would not have been possible without the extensive development of electrification. Much has been done, but much remains to be done in the future, particularly during the current five-year plan.

Ths scale of increasing the generating capacities within the republic is determined both by the growth in the republic's consumption and the need to meet a significant portion of power consumption within the Northwest OES.

Starting in 1981 the need to satisfy the rapidly growing needs for electricity demands a further increase in the production capacities of the Litovskaya power system. The most efficient answer to this problem within the republic will be the use of nuclear power.

In the northeastern section of Lithuania the large Ignalinskaya atomic electric power station (AES) is being built. This AES has a rated capacity of 3,000 MW. It will have channel uranium-graphite reactors with a per-unit capacity of 1,500 MW. The gradual increase in this stations capacity will make it possible to provide the needed pace of development of the republic's power industry. In the years 1983-1985 this power station will receive two reactors. After they are put into operation power generation for the network will amount to 19 billion kW-hours per year.

Along with this to meet the growing needs of the city administrations for central heating, the combined generation of thermal and electric power through the construction of central heating plants in the cities and regional large capacity boilers will be further developed. Construction is coming to an end at the Mazheyskaya TETs; and the first section of the Vil'nyusskaya TETs-3 will be put into operation.

A complicated problem of the electric power industry is meeting the peak and semi-peak portion of the load schedules for both the Litovskaya power system and the entire Northwest OES. The existing thermal and atomic power stations, which comprise the basis of the association's power industry, do not make it possible to regulate capacities within broad limits. For these purposes in 1977 on the shore of the reservoir of the Kaunasskaya GES construction was started on the Kayshyadorskaya water storage power station (GAES) with an installed rated capacity of 1,600 MW and a water pressure of more than 100 meters. At the GAES it is planned to install some eight reversible hydrogenerators with a rated capacity of 200,000 kW each. The introduction of the first GAES units is to take place at the end of the current five-year plan.

The completion of these generating capacities will provide for the growth in the production of electric power during the five-year plan of one hundred percent, as called for in the Basic directions for the economic and social development of the USSR during the years 1981 through 1985 and for the period up to 1990.

To handle the capacity of the new generating sources and particularly the Ignalinskaya AES in the 11th Five-Year Plan it is planned to build several new VL 330 kV transmission lines.

In order to increase the stability and reliability of the power system and also to reduce the expenditure of electricity for its transformation at 110 and 330 kV substations it is planned to install synchronous condensers and batteries of statistical condensers.

Further development will be given to 35 and 110 kV power networks. During the current five-year plan some 900 km of these lines will be built; and 99,300 kV amperes of transformer capacities will be put into operation at substations. It is also planned to build 4,740 km of VL 10 kV power lines.

The entire collective of the Lithuanian power industry workers are resolved to successfully fulfill the historic decisions of the 26th CPSU Congress and to greet the sixtieth anniversary of the formation of the USSR and to make an important contribution in realizing the food program.

8927
CSO: 1822/50

NON-NUCLEAR POWER

LATVIAN ELECTRIC POWER DEVELOPMENT

Moscow ENERGETIK in Russian No 9, Sep 82 pp 25-26

/Article by I. Ya. Ayzsilniyeks, chief of the Main Production Administration of Power and Electrification of the Latvian SSR: "Development of the Power Industry of the Latvian SSR"/

/Text/ The Latvian SSR joined the Union of Soviet Socialist Republics in June 1940. During an historically short period of time Soviet Latvia was converted into a republic with a developed industry, intensive agriculture, advanced culture and a high living standard for its workers. During the years 1940 through 1980 the amount of national income increased some 10.5-fold.

In 1939 in bourgeois Latvia the rated capacity of all electric power stations amounted to 121,000 kW.

During the Second World War the occupiers did considerable damage to the republic's economy. The Kegumskaya GES, Rizhskaya GRES and other power stations were blown up. Following the liberation of Soviet Latvia in 1944 the total rated capacity of the power units still in operation amounted to only six percent of the prewar capacity.

In the postwar period the power industry of the Latvian SSR had to be completely done over. Power industry workers - people of various nationalities - labored tirelessly to rebuild the Kegumskaya GES and the Rizhskaya GRES. The komsomol played a leading role in this work.

By 1947 the generation of electricity reached the 1940 level; and in 1950 the rated capacity of the power stations reached the prewar level, while the generation of electricity exceeded the 1940 level some two-fold.

In April 1946 the Latvian power administration (Latvenergo) was formed.

In 1951 Latvenergo included all of the largest power stations of that time: the Kegumskaya GES, the Rizhskaya GRES, the Daugavpilsskaya, Yelgavskaya, Liyepayskaya and Ventspilsskaya GRES's, and the 88 kV power transmission lines with regional electrical substations, and the Riga city electric power networks.

In 1952 in Riga construction began on TETs-1, the first power station in the Latvian SSR with equipment having high pressure steam. This solved the problem of providing industry and the municipal sector with electricity and heat. The station burned peat. The first turbounit with a rated capacity of 25,000 kW began operation in January 1955; the second and third units with the same rated capacities went on line in 1955 and 1957. Then in 1958 the fourth turbounit with a rated capacity of 50,000 kW was put into operation.

At the same time equipment modernization was undertaken at republic power stations.

Since 1961 the administration of the power industry has managed the unified power industry of the republic, having taken over the rural and municipal power industries.

A decisive event for the further development of the Latvian power system was the construction and introduction in 1960 of 330 kV power transmission lines from the Pribaltiyskaya GRES in the Estonian SSR to the city of Riga. This marked the beginning of the creation of the unified power system of the Northwest of the USSR. The Latvian SSR received the needed amount of inexpensive electricity for the development of the republic's industry. At the end of 1960 on the Daugava River construction was started on the Plyavin'skaya GES with a rated capacity of 825 MW. This hydroelectric power station was built to cover the peak load of the Northwestern unified power system. The first units of this power station were put into operation in 1965; the final unit went on line in 1966.

The Plyavin'skiy hydrounit was built in complicated geological conditions, on poorly compressed soil with a significant head of ground water. It differs in its original design and the compactness of its concrete structures, which was achieved by combining the spillway with the building of the hydroelectric power station. The Plyavin'skaya GES is a remarkably economical project, the relative indicators of which are better not only of those built but of those similar power stations which are planned for construction. The Plyavin'skaya GES bears the name of V.I. Lenin.

Following the Plyavin'skaya GES the third hydroelectric power station on the Daugava River was built - the Rizhskaya GES. This station's first unit was placed on load at the end of 1974; the last (sixth) unit went on line at the end of 1975. The rated capacity of the Rizhskaya GES is 402 MW.

This hydroelectric power station solved the problems of providing water to the city of Riga. Motor vehicle and railroad crossings were created across the Daugava. Also solved were the fishing industry problems and providing Riga with a reliable source of electricity.

In order to increase the throughput capacity of the Kegumskaya GES it was expanded with the installation of three hydrounits with a total rated capacity of 192 MW.

The fourth hydroelectric power station in the Daugava cascade will be the Daugavpilsskaya GES with a rated capacity of 300 MW. The construction of this power station is stipulated in the Basic directions for the economic and social development of the USSR in the years 1981 through 1985 and the period up to 1990.

The period of time between 1960 and 1980 in the republic's power industry is characterized by the switch to centralized heating for industrial enterprises and the housing-municipal sector. The thermal capacity of the Rizhskaya TETs-1 has been brought to 600 Gcal/per hour. Nearly all new housing developments in Riga starting in 1960 have been connected to thermal heating networks of the power system. A unified heating network was created using hot water on the main right-hand shoreline of Riga. It combined for parallel operation the Rizhskaya TETs-1, the Rizhskaya GRES, the "Kengarags" heating plant, and the Rizhskaya TETs-2 with a thermal rated capacity of 800 Gcal/per hour.

One of the noteworthy features of the Rizhskaya TETs-2 is the installation with its boiler of pilot examples of new direct-flow gas-fuel oil water heating boilers, the KVGM-100. These boilers yield high technical-economic indicators and significantly increase the reliability of the heating supply as compared with the series-produced boilers of the PTVM type.

A similar pilot specimen of the KVGM-100 boiler, which burns natural gas, has been installed at the "Imanta" heating plant.

Test results and experimental operation of these pilot KVGM-100 boilers were used to put them into series production.

Along with the construction of thermal power stations and hydroelectric power stations work was being done on electrical substations and 110 and 20 kV power transmission lines. The simplicity of design and low cost of 20 kV power lines ensured the rapid pace of network construction work and the far reaching expansion throughout the republic of distribution networks. This made it possible by as early as 1963 to complete the first stage in the electrification of agriculture in the Latvian SSR ahead of schedule - all of the republic's kolkhozes and sovkhozes were linked with the state power network. By the 50th anniversary of the October Revolution the second stage in rural electrification was successfully completed - all production brigades, elements and farms in the kolkhozes and sovkhozes had received electric power.

In 1981 the length of the power transmission lines at 330 kV within the republic exceeded 940 km; the 110 kV lines approached 3,700 km; and the length of the 20 kV power lines was almost 25,000 km. The 6 - 10 kV power lines exceeded 2,670 km and the .4 kV lines covered a distance greater than 60,000 km.

The Latvian power system possesses significant dispatch and technological control means. First of all it is necessary to mention the high frequency communications channels and remote control, which have been organized on the 110 and 330 kV power transmission lines. These channels are used for transmitting from power facilities to dispatch points remote control information on the status of the switching equipment of telemonitoring systems and remote measurements, the basic mode parameters of the power facilities, and also for transmitting signals of relay shielding and remote control.

Remote control information has become a means not only for visual dispatch monitoring of the mode of individual power facilities. With the introduction of this information into computers and subsequent display on a screen this information makes it possible to solve complicated mode problems and to consult with the dispatcher and make on-the-spot decisions.

Radiotelephone communications using radio-relay lines, stationary and amateur radiostations have become very popular within the power system. In recent years the radiostations are used for organizing radio-controlled channels, which are used for the remote control of circuit breakers of capacity at unmanned distribution points.

Within Latvenergo computers were initially used for mode calculations within the power system (the first section of ASU P, 1975). Later they were used for operational and dispatch and mode control of the power system and for carrying out power inspectorate tasks and capital construction, solving labor and personnel matters, and also for planning estimates and calculations for the future development of the sector, and for automating bookkeeping (second section of ASU, 1980).

Within the Latvian power system for the first time in the USSR an automated control system was developed and put into operation within all network enterprises. A system for assembling and transmitting information from power system enterprises is being created. Small computers have been installed for automating dispatch control functions.

Work continues on the creation of an organizational-technological automated system for controlling the power system. The first section of such a system is to be put on line in 1985.

In the 11th Five-Year Plan power transmission lines are being built, as are 110 kV electric power substations. This will make it possible to connect new consumers and to reduce electric power losses in the networks and to ensure a reliable source of electricity for facilities.

For the development of the electrification of agriculture it is planned to build electric power substations at 110/20 kV in regions where agricultural load is concentrated. The construction of these substations will make it possible to connect the more important agricultural consumers to the 110 kV network.

The mainline thermal networks in the city of Riga will also be further developed during the 11th Five-Year Plan.

8927
CSO: 1822/50

AZERBAIJANI HEADS TYUMEN' GEOLOGICAL ADMINISTRATION

Baku KOMMUNIST in Azerbaijani 13 Apr 82 p 3

[Interview with Farman Salmanov conducted by A. Bayramov]

[Text] "I went through the half-opened door. A middle-aged man with white hair was deep in thought studying a chart. It is our legendary compatriot Farman Salmanov, Socialist Hero of Labor, Lenin Prize laureate, Dr of Geology and Minerology and Chairman of the Tyumen' Chief Geological Administration.

Our visiting card named him Academician Azad Mirzajanzade F. Salmanov. He was, in truth, our visiting card in Siberia. To his question 'Where are you from?' I answered 'I am Azerbaijani;' when he heard this, his face lit up. "Is this the place of our Farman Salmanov?' I asked. 'Welcome, welcome, my friend...' Then all doors were opened.

The words of an old Sibiryak echoed in my ears." The present rise of Western Siberia is connected with the name of Farman Salmanov. In the taiga everyone knows him as 'their own man' and meet him with liking and respect. Farman Salmanov won this liking and respect in the years when many doubted the existence of oil in Siberia. He is one of those who made Siberia known to the whole world and brought the taiga, which had been immersed in the silence of centuries, to life.

Even in the most difficult moments Farman Salmanov did not lose faith nor turn from his belief. His courage and belief astounded many. But how did he come to such a firm belief that there was oil in Siberia? We began our interview with this question.

[Answer] "The well-known Soviet geologist I. M. Gubkin, after long researches in the 1930s, came to the conclusion that behind the eastern chain of the Urals a rich oil field was located. He claimed that since there was oil in North America we would have to find a similar treasure-trove in Western Siberia. This thought, expressed with such foresight by Academician Gubkin, initiated a heated discussion which lasted until the day when oil was discovered in Siberia. When I was studying at the M. Azizbeyov Azerbaijan Oil and Chemistry Institute, I, like my fellow students, actively participated in these discussions. A professor's statement to the effect the 'searching for oil in Siberia is completely meaningless' compelled me to think about

it seriously. I acquainted myself with Gubkin's research and the hypotheses of his opponents. As a result, I devoted my diploma project to this subject when I was finishing up at the Institute. In order to write the diploma work up I spent a summer in Western Siberia. On the basis of preliminary research I reached the conclusion that one had to drill exploratory wells in the Middle Obya region and conduct petroleum exploration basically on the upper strata.

I tried to analyze the means to explore the oil beds of Western Siberia and master its rich resources in the diploma work. Certainly, what I am now saying were thoughts which did not emerge from the productive effort of a youth just beginning his first acquaintanceship with Siberia.

When I was writing my diploma work it never entered my mind what the labor cost would be for oil exploration in Siberia. Siberia would not capitulate and concealed its resources from men. As for those who did not believe in I. M. Gubkin's theory, they were revived by every stroke of bad luck and raised their cries against the millions spent by the state for a barren place. Finally, in June 1960, Siberian oil workers turned desire into reality--the first exploratory on the Konda River shores hit a gusher. In October 1961 the operation of a second oil well quelled all doubts and reservations. It created a firm bleief in the prospects of an oil bed in the eastern region of the territory--the discovery of a 'third Baku.'

The new well was struck in the course of the opening of the 22nd CPSU Congress. Oilworkers sent a report about this important event to the Congress. Representatives at the Congress evaluated this joyous news from Siberia as important economic news which would play an important role in the development of our country. Antonina Grigoryevna, a delegate at the 22nd CPSU Congress and Chairman of the Surgut rayon ispolkom sent the oilworkers a congratulatory telegram from Moscow. The telegram carried roughly this text: 'Hearing the news about the discovery of oil in our territory opened my eyes with joy. I embrace you all, beloved geologists. My native Khanty people are reborn with your new discovery...'

[Question] "It is known that Siberia not only made people famous, but the people also made Siberia famous. What can you say about the heroes who made Siberia famous?"

[Answer] "First of all, I would like to say that one belief unites all these peoples--the belief that Siberia has a significant amount of oil! The life's ideal of these heroes is to give over Siberia's resources for the use of the people. Thus, they swept aside every obstacle. They were firmly united to conquer Siberia's rigorous nature. Not even a mountain could stand before this unity. And Siberia could not withstand it and capitulated.

One can talk a lot about all those working in Siberia. I would like to briefly discuss some of the people who courageously met the countless attacks of the ill-wishers, who considered the search for oil in Siberia to be stupid, and also those people who, having worked here for 20 to 25 years, conquered the elementary forces of nature.

The first oilwell in Sanm was the fruit of the hard labor of brigade members led by S. N. Urusov. Semyon Nikitich's drilling data was a record among the Siberian oilworkers which stood for a long time. Later, he improved on the record several times. The clear-seeing, powerfully-built, turbulent S. N. Urusov did not like to talk a lot. Going behind the control panel of the excavation equipment, he demonstrated to his fellow unionists how powerful he was by his own work. He is still in the ranks of the oilworkers.

N. U. Zhumazhanov, Socialist Hero of Labor and head of a group of brigades for the Surgut expedition, was born in Kazakhsatn. When the Great Patriotic War began he went to the front and was wounded by the enemy. After finishing his military service he took part in oil exploration. He rose through the ranks, first as a worker and excavation assistant, then as a master driller. He took part in dozens of well-drilling operations in sectors along the Ob. Although the drilled wells did not give oil at first, his hopes were not dashed and he viewed the future with assurance.

Socialist Hero of Labor and talented pilot I. M. Khokhlov...When I think of this man I remember something that happened some years back: We had to get some equipment quickly to an exploratory well some distance away. Our only hope remained with the pilots. But they did not want to do such a hard job. Then Ivan Tikhonovich came to our help. We got the drilling equipment to the explorations on time. Other pilots, with I. T. Khokhlov as an example, later did not refuse to help in such difficult moments.

Many are acquainted with V. T. Golovenko, Deputy Chairman of the Krasnoselkupsk expedition, as a careful, diligent worker. A number of years ago he drilled an artesian well and made a Russian steam bath. Later he created a support economy for the geologists and planted potatoes in land which was not hostile to farming. The unloading of equipment to the expedition which began work in the fall in Krasnoselkupsk is still remembered. A large ship was some 20-25 meters from the shore. The lighter equipment was unloaded in an orderly manner. But how could one unload the five tractors still on the deck? Under Golovenko's guidance they put together a large raft made of beams and extended it to the ship. This was very dangerous. But there was no other way. Golovenko took all responsibility on himself, and got behind the steering wheel of a tractor. The platform cum raft sunk into the water under the tractor's weight. However, all five tractors were brought to the shore. Later, I heard that a bus being driven by V. T. Golovenko when he was working at 'Great Earth' had an accident and he demonstrated heroism in the basic sense of the word. While he was evacuating passengers his legs were burned. When he came to Siberia he hid this from the doctors and started to work. In the winter and during seasonal changes his legs put him in agony. But it never entered his mind to leave Siberia.

Certainly one could extent this list. But this short talk about a few individuals gives a good idea about the great willpower these heroes brought to Siberia, and their aspirations and activities.

[Question] In Siberia many Azerbaijani komsomol members are working. One hears good words about them from local residents.

[Answer] "Yes, an army of Azerbaijanis is working in Siberia. Everyone talks admiringly about these hard-working, pleasant people who are faithful to their international obligations. Aleksandr Maharramov is from one of the first 'landing parties' in Siberia. He has drilled exploratory wells by the hundreds and taught thousands of youths the mysteries of the oil trades. In his spare time he is busy landscaping the cities of Surgut and Nizhnevartovsk. He plants trees together with a number of patriots and brings shrubbery into sectors unsuited for agriculture. Later, he began a chain of forests for the young trees. This work, which demands great care and hard work, has been very rewarding. The cities of Surgut and Nizhnevartovsk are reminiscent of the emerald-garbed southern cities. A. Maharramov actively participated in laying the Nizhnevartovsk sewage system, in the construction of the water purification plant and a number of other things. For the last 13 years he has been elected to the city Soviet, first in Surgut, then in Nizhevartovsk. The order of the Banner of Red Labor and a number of other medals decorate his chest.

Mobil Mammadov, Chairman of the Nizhnevartovskneftgeofizika Trust expedition, after graduation from the M. Azizbeyov Azerbaijan Oil and Chemistry Institute, was appointed to Siberia. In a short time he won the respect of his work comrades through his deep knowledge, good nature and love of work. He was promoted from the ranks of the engineers to expedition chairman. The driller Muradkhan Muradov took his first steps in production in Siyezen. Later he came to Siberia on a komsomol trip. Now this youth is considered one of the most successful drillers in the 'oil capital' of Nizhnevartovsk. Nurse Anakhanym Mammadova is known as a master of her work and excells in competitions of skill among her colleagues...

Contemporary Siberia is a brilliant example of the friendship of peoples. Now we often hear the expression 'the whole country is building Siberia;' in truth, representatives of the entire country, of all peoples of our Fatherland, are taking part in the building of new cities in Western Siberia, and the exploitation and development of new oil beds. Thousands of oil workers who gained production experience in the oil fields of Azerbaijan have worked hard in making the 'third Baku' famous. Valuable drilling and oil field equipment is sent from Azerbaijan to Siberia. This equipment is always received with great gratitude by Siberian oil workers.

The decrees 'On the 60th Anniversary of the Formation of the Union of Soviet Socialist Republics' of the CC CPSU and the 'On Means to Further Strengthen the International Connections of Azerbaijani Workers to the Fraternal Soviet Republics' of the CC AzCP have caused an upsurge of spirit among Azerbaijanis working in Siberia. Now they are actively participating in shipping a million tons of Tyumen' oil and a milliard cubic meters of Tyumen' natural gas to the Fatherland every day, and are making an effort to mark the coming national holiday--the 60th anniversary of the formation of the Soviet Union--with new work skills.

[Question] "The march to Siberia goes on to this day. What would you say to youths who want to work in Siberia?"

[Answer] "I would say not to be afraid of the difficulties, as their predecessors were not. They should be brave and view the future with faith. Aspiration and faith have been the wings of the Siberian oilworkers. By soaring on these wings they have put an eternal end to the silence of the taiga. Modern youths, with the help of these wings, will conquer even greater heights.

[Question] "Recently, oilworkers have often used the phrase 'the country needs a second Tyumen'.' What would you say to this?"

[Answer] "Life is always developing. The great discoveries of yesterday are normal today. From this point of view, of course, the country needs a 'second Tyumen'.' The basic question is where to look. I would say that one should look for a 'second Tyumen'' in Tyumen' itself. To clarify my idea I want to give a few examples. It is known that we are taking oil out of the upper strata in Western Siberia. But geologists hypothesize that there is a lot of oil in the deeper strata. The powerful wells resulting from drilling conducted in deep layers in Urengoy, Surgut and other sectors of Western Siberia bear out these hypotheses.

In the 11th Five-year Plan there will be an even wider use of the natural resources of Western Siberia, which is the basic fuel-energy base of our country. L. I. Brezhnev said in the report of the CC CPSU to our party's 26th Congress:

"The extraction of gas and oil in Western Siberia and its transport to the European part of the country is the most important phase in the energy program of the 11th and the 12th Five-year Plan."

As has been seen, some very important duties stand before us. Through the fraternal help of the peoples of the USSR and their active participation, we will honorably fulfill the obligations of this duty.

CSO: 1830/89 END

END OF FICHE DATE FILMED

10 Jan 83 JB